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tion of the experimental phases of the topic, such as hypnotism, automatic writing, crystal vision; and it further gains strength by the inherent weakness of former theories, both 'centrifugal' and 'centripetal,' which attempted to present the illusion as a reversal of the physiological process of true sensation or of some of the cortical and subcortical functions. In spite of these advantages, it cannot be claimed that this or any other theory at present serves any other purposes than that of a temporary framework for a building that is yet to be planned. The physiologist and the pathologist, as well as the alienist and psychologist, must all expend very much more planning and labor upon the foundations before a really suitable superstructure can be possible. More literally, the present status of the subject seems hardly likely to yield a true explanation of the illusory process, a satisfactory account of what really goes on in nerve and brain-cell as well as in the field of mental processes when we see with the mind's eye.

This criticism is offered in no disparagement of Dr. Parish's essay. His attempt to bring order out of chaos is most commendable, and for what is, perhaps, the most striking example of the fruitful nature of his conception the reader may be referred to is the ingenious analysis of 'audible thinking' as the analogy of 'automatic writing' which is given in Chapter VIII.

A considerable portion of the volume is devoted to the presentation of the statistics of hallucinations of the sane and their critical discussion, one phase of this discussion being devoted to those hallucinations which are supposed to be 'veridical' or to serve as proofs of 'telepathic' agencies. This portion of the work is most commendable; the sincerity and painstaking devotion of the compilers of the census and other evidence for telepathy are fully appreciated and acknowledged. But the verdict is 'not proven,' with a strong indication in favor of the negative. The extreme complexity and variety of the sources of error, the inherent defects of the logical cogency of the evidence, and the likelihood of the applicability of other and more normal forms of explanation, are all admirably set forth and to-

gether form a line of argument which the numerically strong but logically weak accumulations of cases are not likely to overcome. This careful sifting of obscure sources of error, this technical and thorough analysis of the real nature of these elusive hallucinatory conditions, makes rather difficult reading, but it is the only profitable mode of dealing with the subject.

This lack of popular attractiveness in Dr. Parish's work is probably a desirable feature, at least in some respects. The interest in this and kindred topics has been entirely too much centered upon the explanation of individual experiences and the proving of this or that hypothesis. The prevalent popular attitude is that of the man who has had an experience and wants it 'explained,' even to the most trifling detail, and who, in default of such explanation, feels warranted in disparaging the science that so dismally fails when practically tested, and in accepting any hypothesis, however unnatural or unscientific, which seems to cover his case. It is well to impress this individual with the inherent difficulty of such study, with the technical acquisitions needed to qualify one to form any opinion on the matter, and with the true statistical and impersonal method of dealing with 'cases.' The principle that in the progress of science the interest in the abnormal precedes and only slowly gives way to an interest in the normal has recently been well emphasized and illustrated;* it is as true in psychology as in other sciences. The superficial interest in much that is 'psychic' doubtless belongs to this earlier stage of culture and will probably give way to a better comprehension and appreciation of man's normal psychology. A lesser form of utility of the present volume is in disparaging an undesirable and uncritical interest in the abnormal.

JOSEPH JASTROW.

Manual of Bacteriology. By ROBERT MUIR, M.A., M.D., F.R.C.P., Ed., Lecturer on Pathological Bacteriology, and Senior Assistant to the Professor of Pathology, University of Edinburgh; Pathologist, Edinburgh Royal Infirmary; and JAMES RITCHIE, M.A., M.D., B.Sc., Lecturer in Pathology, University of

* By W J McGee, SCIENCE, Vol. VI., p. 413.

Oxford. With one hundred and eight illustrations. Edinburgh and London, Young J. Pentland; New York, The Macmillan Company. 1897. Price, \$3.25.

Bacteriology as a distinct domain in biology has developed with amazing rapidity within the past few years, owing partly to the stimulus which a new technique has afforded, partly to the keener appreciation of the importance in biology of a knowledge of the simpler life process down near the border line; but more than all, perhaps, to the fact that among the bacteria are a few forms which cause a large part of the acute diseases of men and animals. For the latter reason bacteriology has been a foster child of medicine and, in the minds of many, is only one of the congeries of disciplines which we call medical science. But as our knowledge grows, we realize that the relationships of bacteriology to medicine embrace but a small part of bacteriological lore, which reaches far away from disease and deals with most significant phases of organic life throughout the earth.

In reality, the book before us is not a manual of bacteriology, but a manual dealing with those phases of bacteriology which concern disease, or medical bacteriology.

About one-fourth of the text relates to the general subject of the morphology, biology and technical methods of study of the bacteria; a few pages are devoted to non-pathogenic micro-organisms, while the remainder is given to a general consideration of the relationship of bacteria to disease, and to an epitomized description of the more important infectious diseases, especially of man. A discussion of the significant subject of immunity follows and, finally, in a series of appendices, certain of the important infectious diseases are reviewed whose etiological factors are not bacterial or are as yet unknown.

There are many manuals of medical bacteriology in many languages and of all grades of excellence, and this phase of bacteriology is growing so rapidly that new books and new editions are necessary.

This book of Muir and Ritchie is a most valuable addition to the list and might wisely supersede many of the current elementary works.

It is a well-digested, well-arranged and wisely and clearly expressed epitome of the medical phases of bacteriology and of the bacteriological phases of disease. The historical glimpses of recent studies upon some of the infectious diseases aid greatly in the comprehension of the present point of view regarding them and afford clues which, in connection with the judiciously limited bibliography at the end, may lure and guide the student into a deeper acquaintance with his theme. The illustrations, over one hundred in number, are largely from photomicrographs and the half-tone reproductions are for the most part as satisfactory as the technical limitations will permit.

The book is altogether excellent, and is really a model epitome of a difficult and complex theme, a safe and stimulating guide to the student and a boon to the busy practitioner who must read as he runs, if he reads at all.

T. M. P.

NEW BOOKS.

The Founders of Geology. SIR ARCHIBALD GEIKIE. London and New York, The Macmillan Co. 1897. Pp. x+297. \$2.00.

Les ballons-sondes de Mm. Hermite et Besançon et les ascensions internationales. Paris, Gauthier-Villars et fils. 1898.

The Story of Germ Life. H. W. CONN. New York, D. Appleton & Co. Pp. 199.

Health of Body and Mind. T. W. TOPHAM. 1897. Pp. 296.

Elements of Plane and Spherical Trigonometry. EDWIN S. CRAWLEY, University of Pennsylvania. 1897. Second edition. Pp. 178.

Physical Experiments. ALFRED P. GAGE. Boston and London, Ginn & Co. 1897. Pp. ix+97.

Sixteenth Annual Report of the Bureau of American Ethnology, 1894-1895. J. W. POWELL. Washington, Government Printing Office. 1897. Pp. cxix+326.

A Correction: We have been requested to call attention to the fact that the sentence on p. 534, at the bottom of the first column of SCIENCE for October 8th last, beginning 'The Boston Trustees,' owing to an oversight was not omitted, as it should have been.